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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/379,481	08/23/1999	MICHAEL BENJE	2734/MEINKE/	1331

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EXAMINER	
LEUNG, JENNIFER A	
ART UNIT	**PAPER NUMBER**
1764	

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/379,481	BENJE, MICHAEL	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-5,7-9,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-5,7-9,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 19, 2003 has been entered.

Response to Amendment

2. Applicant's amendment submitted on July 21, 2003 has been received and carefully considered. Claim 13 has been added. Claims 1, 2, 6, 10 and 11 are canceled. Claims 3-5, 7-9, 12 and 13 remain active.

Response to Arguments

3. Applicant's arguments with respect to claims 3-5, 7-9, 12 and 13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

4. Claims 5 and 8 are objected to because of the following informalities:

In claim 5, line 4, "a said dome part" should be changed to -- said dome part -- .

In claim 8, line 3, "within the range of 1:9" should be changed to -- within the region of 1:9 -- (or should be changed to -- about 1:9 --), because "1:9" is not a range but a specific ratio.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reichl (US 2,585,274) in view of Newby et al. (US 4,973,458).

Regarding claim 5, Reichl (FIG. 1; column 4, line 57 to column 5, line 6) discloses an apparatus (i.e., synthesis reactor **10**) comprising a dome part (i.e., the upper portion of reactor **10**) and a baseplate (unlabeled; see FIG. 1) in the dome part for carrying filter cartridges (i.e., ceramic filters **12**) on the lower surface thereof; wherein a space in the dome part is divided, above the baseplate, into at least two chambers (i.e., a plurality of zones, separated by baffles **13**); each chamber having an outlet for a main gas stream and a bypass gas stream (i.e., lines **17**, **19** and **20**). Reichl further discloses,

> "The substantially catalyst-free reaction products are withdrawn from the top of the reactor. These gases are then *cooled and processed as well known in the art and further treatment* will not be described in detail." (column 4, lines 47-56).

Although Reichl is silent as to the *cooling* and/or *further treatment* being conducted in a "quench vessel", it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide an appropriate vessel to the apparatus of Reichl, in order to supply a means for containing the processes of cooling and/or further treatment of the reaction products stream.

Reichl is further silent as to the filter cartridges **12** being "dippable" into an upper region of the fluidized bed located in reactor **10** (see FIG. 1).

Newby et al. teach an apparatus similar to the apparatus as disclosed by Reichl, wherein the apparatus of Newby et al. comprises a dome part (i.e., upper section **59**) and a baseplate (i.e., tubesheet **27**) in the dome part **59** for carrying filter cartridges (i.e., filter elements **31** and **43**) on the lower surface thereof; wherein the filter cartridges **31, 43** are "dippable" into the upper region of a fluidized bed **7** (see Figures). Newby et al. teach that by submerging the filter elements into the fluidized bed, "The plurality of first hollow, ceramic, barrier filter elements **31** are scoured by the fluidized bed of granular media **9** resulting, in effect, in a continuous "self cleaning" of the filter elements **31**." (column 4, lines 38-42).

It would have thus been obvious for one of ordinary skill in the art at the time the invention was made to modify the filter elements **12** in the apparatus of Reichl such that they were "dippable" into the fluidized bed of the reactor **10**, because providing filter elements which are submerged into the fluidized bed results in a continuous "self cleaning" of adhered particulates on the surface of the filters, as taught by Newby above.

Regarding claim 7, Reichl discloses, "the vessel above the filters may divided into a plurality of sections by baffles **13** to provide a plurality of zones *separately communicating* with a group of the ceramic filters," (column 6, lines 62-68), wherein the separate communication is achieved by controlled operation of valved lines **18**, **19** and **20**; each valved line, respectively, exiting a single zone (see FIG. 1). However, Reichl is silent as to the groups of ceramic filters of a given zone having a different pore size than the groups of ceramic filters in a separate zone, such that "controlled passage of dust particle fractions" is enabled.

Newby et al. further teach the provision of separate groups of ceramic filters; namely, a group of first filter elements **31** and a group of second filter elements **43** (FIG. 5, 6). The first

filter elements **31** allow a major portion of the reactant gases to pass through, wherein "particulate contaminants" of the fluidized bed are separated from the gas stream by walls **37** of the first filter elements **31**. The second filter elements **43** allow a minor portion of the reactant gases to pass through, wherein the "fine material" from the fluidized bed is separated from the gas stream by walls **45** of the second filter elements **43** (column 6, lines 13-23, 33-52). Newby et al. also teach,

> "The filter element length and permeability must be such that *the gas withdrawal rate through the filter elements will be limited to maintain fluidization over the entire bed height. A permeability profile may be used in the filter elements to control the gas withdrawal flow*, or a set of filter elements of different lengths may be placed in the bed to provide a profile of filter surface area." (column 5, lines 35-43).

The permeability of a filter element directly corresponds to the average pore size of the filter element, because a higher permeability is inherently characterized by a larger pore size and a lower permeability is inherently characterized by a smaller pore size.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the filter cartridges in the apparatus of Reichl, such that groups of ceramic filters of a given zone comprised a different pore size than the groups of ceramic filters in a separate zone, on the basis of suitability for the intended use, because varying the permeability profile of the filter elements allows the gas withdrawal rate to be controlled to a level to such that fluidization is maintained over the entire bed height, as taught by Newby et al., above.

Regarding claim 8, the limitation that, "the ratio of filter elements allowing through dust particles to the filter cartridges retaining dust particles is within the range of 1:9", the specific ratio is not considered to confer patentability to the claim since the precise ratio would have been considered a result effective variable by one having ordinary skill in the art. Also, it is noted that

the present specification sets forth on page 5 (last paragraph) that the claimed ratio, is at best, a preferred limitation. As such, without more, the claimed ratio cannot be considered "critical". Accordingly, one having ordinary skill in the art would have routinely optimized the ratio of filter elements to filter cartridges in the system to obtain the desired dust particle fractions. *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 9, Reichl discloses a cleaning means using compressed gas pulses on the baseplate (i.e., purge lines **14**, **15** and **16** introduce gas to blow back the catalyst from the filters **12**; FIG. 1; column 4, lines 69-70).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reichl (US 2,585,274) in view of Newby et al. (US 4,973,458), as applied to claim 5 above, and further in view of Shah (US 4,328,353).

Reichl discloses cartridges **12** comprise ceramic filter cartridges, but are silent as to whether cartridges **12** may instead comprise, specifically, sintered metal filter cartridges. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select the recited filter cartridges for cartridges **12** in the modified apparatus of Reichl, on the basis of suitability for the intended use, since the use of sintered metal filter cartridges for filtering reactant product streams in catalytic, fluidized bed operations is well known in the art, as evidenced by Shah, and it has been held that the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967);

In re Ruff 118 USPQ 343 (CCPA 1958). Shah teaches the use of sintered metal filter cartridges **14**, **31** to remove a powder contained in a gaseous product (column 4, lines 45-54).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Legutke et al. (US 4,310,713) in view of Antonini et al. (US 3,907,912) and Newby et al. (US 4,973,458).

Legutke et al. discloses a method of removing dust particles from a fluidized bed reactor for oxychlorination of ethylene, wherein the oxychlorination is conducted in a fluidized bed reactor 7 using a copper-II-chloride catalyst, and the reaction gases are removed overhead from an inherent dome part of the reactor 7 via a conduit **8**, after the stripping of particulates and catalyst from the reaction gases using a cyclone. The reaction gases in conduit **8** are then passed to a quench vessel, such as first condensation stage **9**, wherein the reaction gases are cooled down by means of water introduced through conduit **18**. (column 4, lines 48-63; FIG. 1).

Although Legutke et al. teach a cyclone instead of the recited filter cartridges, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute filter cartridges for the cyclone in the method of Legutke, since the use of filter cartridges for the removal of particulates, as an alternative to cyclones, is well known in the art. Furthermore, substitution of known equivalent structures involves only ordinary skill in the art, *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958), and substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution, *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950). Antonini et

al. evidence such conventionality by teaching the equivalency of removing catalyst particles entrained in the gaseous product stream with either a cyclone or filtration means in a fluidized bed oxychlorination reaction. For instance, Example 7 teaches a "filtration device", whereas Example 10 teaches a "system of cyclones".

The collective teachings of Legutke et al. and Antonini et al. are silent as to the method further comprising the step of removing a partial gas stream as a bypass gas stream in addition to a main gas stream out from the reactor, wherein the bypass gas stream comprises a predetermined content of dust particles of a size smaller than a predetermined particle size.

Newby et al. teach a fluidized bed reactor comprising a plurality of filter elements for the separation of particulates from the reaction gases exiting the dome of the reactor. In particular, Newby et al. teach separate groups of ceramic filters: a group of first filter elements **31** and a group of second filter elements **43** (FIG. 5, 6). The first filter elements **31** allow a major portion of the reactant gases to pass through (i.e., corresponding to a "main gas stream"), wherein "particulate contaminants" of the fluidized bed are separated from the gas stream by the walls **37** of first filter elements **31**. The second filter elements **43** allow a minor portion of the reactant gases to pass through (i.e., corresponding to a "bypass gas stream"), wherein the "fine material" from the fluidized bed is separated from the gas stream by walls **45** of second filter elements **43** (column 6, lines 13-23, 33-52). As such, the minor portion passing through second filter elements **43** "will have a predetermined content of dust particles of a size which is smaller than a predetermined particle size." Newby et al. also teach,

> "The filter element length and permeability must be such that *the gas withdrawal rate through the filter elements will be limited to maintain fluidization over the entire bed height. A permeability profile may be used in the filter elements to control the gas withdrawal flow*, or a set of filter elements of different lengths may be placed in the bed

to provide a profile of filter surface area." (column 5, lines 35-43).

Accordingly, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the step of "removing a partial gas stream as a bypass gas stream in addition to a main gas stream out from said reactor, said bypass gas stream having a predetermined content of dust particles of a size which is smaller than a predetermined particle size," in the modified method of Legutke et al., because such step enables the gas withdrawal rate to be controlled to a level to such that fluidization is maintained over the entire bed height, as taught by Newby et al., above.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Legutke et al. (US 4,310,713) in view of Antonini et al. (US 3,907,912) and Newby et al. (US 4,973,458), as applied to claim 13 above, and further in view of Reichl (US 2,585,274).

The collective teachings of Legutke et al., Antonini et al. and Newby et al. are silent as to the main gas stream and bypass gas stream being removed from separate spaces of the dome part of the reactor. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate reactor configuration such that the main gas stream and bypass gas stream were removed separately in the modified method of Legutke et al., because such a configuration would further facilitate control over the fluidization conditions by allowing separate, controlled communication with a given group of filter elements, as taught by Reichl (The same comments with respect to Reichl apply. See comments above).

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Legutke et al. (US 4,310,713) in view of Antonini et al. (US 3,907,912) and Newby et al. (US 4,973,458), as applied to claim 13 above, and further in view of Daw et al. (US 5,435,972).

Controlling the gas withdrawal rate through the filter elements (i.e., by switching on or off the bypass gas stream in the valved lines **17**, **19** and **20** of Reichl; FIG. 1) inherently enables control of fluidization conditions throughout the bed height (see also Newby, column 5, lines 35-43). Although the collective teachings of Legutke et al., Antonini et al., and Newby et al. are silent as the method further comprising a step of analyzing a catalyst sample and/or change in heat transfer and/or deterioration of the fluidization behavior of the reactor, it would have been obvious for one having ordinary skill in the art to provide a such analysis means to the modified method of Legutke et al., to supply a means for quantifying the conditions of the reactor and signaling appropriate actions for maintaining the reactor under steady state conditions. Daw et al. evidences the conventionality of such concept by teaching a method of analyzing a deterioration of the fluidization behavior and using a controller **38** and corresponding valve to adjust a process variable based on the analysis, in order to maintain fluidized conditions within the reactor (column 4, lines 34-37).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
February 23, 2004

Hien Tran

HIEN TRAN
PRIMARY EXAMINER